The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A beam homogenizer comprising:

an optical system for homogenizing energy distribution of a beam spot in one direction, the beam spot having a linear shape,

the optical system comprising:

first and second cylindrical lenses; and

an optical waveguide including a pair of reflection planes provided oppositely,

wherein the optical waveguide is provided between the first and second cylindrical lenses,

wherein the one direction is a direction of a major axis of the linear shape, ~~and~~

~~wherein a laser beam is incident into a curved surface of the first cylindrical lens and one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide and a curved surface of the second cylindrical lens~~

wherein the first cylindrical lens has a first surface and a second surface facing the optical waveguide and the second cylindrical lens has a third surface and a fourth surface,

wherein a radius of curvature of the second surface is larger than that of the first surface, and

wherein a radius of curvature of the fourth surface is larger than that of the third surface.

2. (Original) A beam homogenizer according to claim 1, wherein the optical waveguide is a light pipe.

3. (Original) A beam homogenizer according to claim 1, wherein the beam spot has an aspect ratio of 10 or more.

4. (Original) A beam homogenizer according to claim 1, wherein the beam spot has an aspect ratio of 100 or more.

5. (Previously Presented) A beam homogenizer comprising:

an optical system for homogenizing energy distribution of a beam spot in one direction, the beam spot having a linear shape,

the optical system comprising:

an optical waveguide including a pair of reflection planes provided oppositely,

first and second cylindrical lenses for expanding and projecting a plane having homogeneous energy distribution formed by the optical waveguide to an irradiated surface,

wherein the first and second cylindrical lenses have first surfaces opposed to each other, the first surface of the first cylindrical lens is concave to the first surface of the second cylindrical lens and the first surface of the second cylindrical lens is convex to the first surface of the first cylindrical lens,

wherein the one direction is a direction of a major axis of the linear shape, and

wherein a laser beam is incident into one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide.

6. (Previously Presented) A beam homogenizer according to claim 5, wherein the optical waveguide is a light pipe.

7. (Previously Presented) A beam homogenizer according to claim 5, wherein the beam spot has an aspect ratio of 10 or more.

8. (Previously Presented) A beam homogenizer according to claim 5, wherein the beam spot has an aspect ratio of 100 or more.

9. (Previously Presented) A beam homogenizer comprising:

a first optical system for homogenizing energy distribution of a beam spot formed on an irradiated surface in a first direction, the first optical system comprising an optical waveguide including a pair of reflection planes provided oppositely;

a second optical system for homogenizing energy distribution of the beam spot in a second direction perpendicular to the first direction, the second optical system comprising a cylindrical lens array,

wherein the beam spot has a linear shape,

wherein the first direction is a direction of a major axis of the linear shape and the second direction is a direction of a minor axis of the linear shape, and

wherein a laser beam is incident into one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide.

10. (Original) A beam homogenizer according to claim 9, wherein the optical waveguide is a light pipe.

11. (Original) A beam homogenizer according to claim 9, wherein the beam spot has an aspect ratio of 10 or more.

12. (Original) A beam homogenizer according to claim 9, wherein the beam spot has an aspect ratio of 100 or more.

13. (Previously Presented) A beam homogenizer comprising:

a first optical system for homogenizing energy distribution of a beam spot formed on an irradiated surface in a first direction;

first and second cylindrical lenses; and

a second optical system for homogenizing energy distribution of the beam spot in a second direction perpendicular to the first direction,

wherein the beam spot has a linear shape,

wherein the first direction is a direction of a major axis of the linear shape and the second direction is a direction of a minor axis of the linear shape,

wherein each of the first optical system and the second optical system comprises an optical waveguide including a pair of reflection planes provided oppositely,

wherein the optical waveguide of the first optical system is provided between the first and second cylindrical lenses, and

wherein a laser beam is incident into a curved surface of the first cylindrical lens and one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide and a curved surface of the second cylindrical lens.

14. (Original) A beam homogenizer according to claim 13, wherein the optical waveguide is a light pipe.

15. (Original) A beam homogenizer according to claim 13, wherein the beam spot has an aspect ratio of 10 or more.

16. (Original) A beam homogenizer according to claim 13, wherein the beam spot has an aspect ratio of 100 or more.

17. (Currently Amended) A laser irradiation apparatus comprising:

a laser oscillator; and

a beam homogenizer for homogenizing energy distribution of a beam spot on an irradiated surface at least in one direction, the beam spot having a rectangular shape,

wherein the one direction is a direction of a major axis of the rectangular beam spot,

wherein the beam homogenizer comprises an optical waveguide including a pair of reflection planes provided oppositely and first and second cylindrical lenses, ~~and~~

~~wherein a laser beam is incident into a curved surface of the first cylindrical lens and one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide and a curved surface of the second cylindrical lens~~

wherein the first cylindrical lens has a first surface and a second surface facing the optical waveguide and the second cylindrical lens has a third surface and a fourth surface,

wherein a radius of curvature of the second surface is larger than that of the first surface, and

wherein a radius of curvature of the fourth surface is larger than that of the third surface.

18. (Original) A laser irradiation apparatus according to claim 17, wherein the optical waveguide is a light pipe.

19. (Original) A laser irradiation apparatus according to claim 17, wherein the laser oscillator is an excimer laser, a YAG laser, or a glass laser.

20. (Original) A laser irradiation apparatus according to claim 17, wherein the laser oscillator is a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, or an Ar laser.

21. (Original) A laser irradiation apparatus according to claim 17, wherein the beam spot has an aspect ratio of 10 or more.

22. (Original) A laser irradiation apparatus according to claim 17, wherein the beam spot has an aspect ratio of 100 or more.

23. (Previously Presented) A laser irradiation apparatus comprising:

a laser oscillator, and

a beam homogenizer,

the beam homogenizer comprising:

a first optical system for homogenizing energy distribution of a beam spot on an irradiated surface in a first direction; and

a second optical system for homogenizing energy distribution of the beam spot in a second direction perpendicular to the first direction, the second optical system having a cylindrical lens array,

wherein the beam spot has a linear shape,

wherein the first direction is a direction of a major axis of the linear shape and the second direction is a direction of a minor axis of the linear shape,

wherein the first optical system comprises an optical waveguide including a pair of reflection planes provided oppositely, and

wherein a laser beam is incident into one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide.

24. (Original) A laser irradiation apparatus according to claim 23, wherein the optical waveguide is a light pipe.

25. (Original) A laser irradiation apparatus according to claim 23, wherein the laser oscillator is an excimer laser, a YAG laser, or a glass laser.

26. (Original) A laser irradiation apparatus according to claim 23, wherein the laser oscillator is a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, or an Ar laser.

27. (Original) A laser irradiation apparatus according to claim 23, wherein the beam spot has an aspect ratio of 10 or more.

28. (Original) A laser irradiation apparatus according to claim 23 wherein the beam spot has an aspect ratio of 100 or more.

29. (Previously Presented) A laser irradiation apparatus comprising:

a laser oscillator; and

a beam homogenizer,

the beam homogenizer comprising:

first and second cylindrical lenses;

a first optical system for homogenizing energy distribution of a beam spot on an irradiated surface in a first direction; and

a second optical system for homogenizing energy distribution of the beam spot in a second direction perpendicular to the first direction,

wherein the beam spot has a linear shape,

wherein the first direction is a direction of a major axis of the linear shape and the second direction is a direction of a minor axis of the linear shape,

wherein each of the first optical system and the second optical system comprises an optical waveguide including a pair of reflection planes provided oppositely,

wherein the optical waveguide of the first optical system is provided between the first and second cylindrical lenses, and

wherein a laser beam is incident into a curved surface of the first cylindrical lens and one edge portion of the optical waveguide and emitted from the other edge portion of the optical waveguide and a curved surface of the second cylindrical lens.

30. (Original) A laser irradiation apparatus according to claim 29, wherein the optical waveguide is a light pipe.

31. (Original) A laser irradiation apparatus according to claim 29, wherein the laser oscillator is an excimer laser, a YAG laser, or a glass laser.

32. (Original) A laser irradiation apparatus according to claim 29, wherein the laser oscillator is a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, or an Ar laser.

33. (Original) A laser irradiation apparatus according to claim 29, wherein the beam spot has an aspect ratio of 10 or more.

34. (Original) A laser irradiation apparatus according to claim 29, wherein the beam spot has an aspect ratio of 100 or more.

35. (Original) A laser irradiation apparatus according to claim 29, wherein the laser irradiation apparatus comprises a moving stage for moving an irradiated surface relative to the beam spot.

36. (Original) A laser irradiation apparatus according to claim 35, wherein the laser irradiation apparatus comprises a transferring apparatus for transferring the irradiated surface to the moving stage.

37. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a non-single crystal semiconductor film over a substrate, and

irradiating the non-single crystal semiconductor film with a laser beam generated in a laser oscillator while moving a position of the laser beam relative to the non-single crystal semiconductor film,

wherein the laser beam is shaped into linear shape through an optical system having first and second cylindrical lenses, a cylindrical lens array and an optical waveguide,

wherein the cylindrical lens array acts upon the linear beam spot in a direction of its minor axis,

wherein the optical waveguide acts upon the linear beam spot in a direction of its major axis, and

wherein the laser beam is incident into a curved surface of the first cylindrical lens, the optical waveguide, a curved surface of the second cylindrical lens, and the cylindrical lens array in this order.

38. (Original) A method for manufacturing a semiconductor device according to claim 37, wherein a light pipe is used as the optical waveguide.

39. (Original) A method for manufacturing a semiconductor device according to claim 37, wherein the laser oscillator is an excimer laser, a YAG laser, or a glass laser.

40. (Original) A method for manufacturing a semiconductor device according to claim 37, wherein the laser oscillator is a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, or an Ar laser.

41. (Original) A method for manufacturing a semiconductor device according to claim 37, wherein the laser beam is shaped so as to have an aspect ratio of 10 or more.

42. (Original) A method for manufacturing a semiconductor device according to claim 37, wherein the laser beam is shaped so as to have an aspect ratio of 100 or more.

43. (Previously Presented) A method for manufacturing a semiconductor device comprising:

forming a non-single crystal semiconductor film over a substrate, and

irradiating the non-single crystal semiconductor film with a laser beam generated in a laser oscillator while moving a position of the beam spot relative to the non-single crystal semiconductor film,

wherein the laser beam is shaped into linear shape through an optical system comprising first and second cylindrical lenses, a first optical waveguide and a second optical waveguide,

wherein the first optical waveguide acts upon the linear beam spot in the direction of its major axis,

wherein the second optical waveguide acts upon the linear beam spot in the direction of its minor axis, and

wherein the laser beam is incident into a curved surface of the first cylindrical lens, the first optical waveguide, and a curved surface of the second cylindrical lens in this order.

44. (Previously Presented) A method for manufacturing a semiconductor device according to claim 43, wherein a light pipe is used as one or both of said first and second optical waveguides.

45. (Previously Presented) A method for manufacturing a semiconductor device according to claim 43, wherein the laser oscillator is an excimer laser, a YAG laser, or a glass laser.

46. (Original) A method for manufacturing a semiconductor device according to claim 43, wherein the laser oscillator is a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, or an Ar laser.

47. (Original) A method for manufacturing a semiconductor device according to claim 43, wherein the laser beam is shaped so as to have an aspect ratio of 10 or more.

48. (Original) A method for manufacturing a semiconductor device according to claim 43, wherein the laser beam is shaped so as to have an aspect ratio of 100 or more.

49. (New) A beam homogenizer according to claim 1, wherein the second surface is plane.

50. (New) A laser irradiation apparatus according to claim 17, wherein the second surface is plane.